

## REMARKS

### I. Amendments

The applicant notes that claims 7-26 have been withdrawn from examination by the Examiner.

In response to the Examiner's objection, claims 6 and 27-35 have been amended. It is, however, noted that other than certain minor formalistic changes, the amendments were not necessary, but they are made as an accommodation in order to expedite the prosecution of the application.

Independent claim 1 is amended to incorporate limitations that further distinguishes the claimed invention over the teachings of the prior art. Support for the amendments may be found in the applicants' published application at paragraphs [0021], [0023], and [0025].

Claim 28 is amended to place it in independent form and to address the Examiner's objection thereto. Claims 29-35, which depend either directly or indirectly from claim 28, are amended to address the Examiner's objections. It is noted that the Examiner did not reject claims 28-35 over prior art, and, thus, it is submitted that these claims are now in a form suitable for allowance.

New claims 37-56 have been added to the application. Among these claims, claims 37 and 48 are independent. Claims 38-47 depend either directly or indirectly from claim 37, and claims 49-56 depend either directly or indirectly from claim 48.

### II. Objections to Claims 6 & 27-35

It is respectfully submitted that the amendments to the claims sufficiently address the Examiner's objections to claims 6 and 27-35.

### III. §102(b) rejection of claims 1-6, 27 & 36 over Takeuchi et al. (US 4,206,036)

The Takeuchi patent discloses a hydrodesulfurization catalyst that contains from 3 to 40% of at least one of molybdenum and tungsten and from 2 to 15% of at least one of nickel and cobalt with the balance being titanium oxide. *See* column 4, lines 24-35. Takeuchi, also,

however, teaches that it is undesirable for the nickel and/or cobalt content of its catalyst to exceed 15%, *see* column 4, lines 35-42, and for its molybdenum and/or tungsten content to exceed 40%. *See* column 4, lines 43-48. Takeuchi further states that the method of making its catalyst is not limited, *see* column 5, lines 35-40, thus, suggesting that there is no criticality in its method of manufacture. Takeuchi clearly indicates that a feature of its catalyst is the use of titania in place of alumina. *See* column 2, lines 65-68. This statement, along with the indication throughout the Takeuchi disclosure that the balance of the inventive catalyst after the inclusion of the metals is to be titanium oxide, suggests that the preferred Takeuchi composition is not to contain refractory materials other than titania, even though Takeuchi indicates that a small amount of the titanium oxide may be replaced with other refractory materials. *See* column 4, lines 48-53.

Independent claim 1 has been amended to include limitations that distinguish the claimed invention over the teachings of the cited prior art. For instance, the unsupported catalyst composition is to have its metal components and refractory oxide material combined together prior to shaping, and the refractory oxide material must include titania powder that has an average particle diameter of 50 microns or less and a particularly large surface area. It is respectfully submitted that this combination of features is not taught by the Takeuchi reference, and, therefore, the reference does not anticipate, nor does it render obvious, the invention of amended claim 1 and dependent claims 1-6 and 27.

Concerning independent claim 36, the Takeuchi patent fails to teach an unsupported catalyst composition having the particular combination of features that are recited in claim 36. For instance, Takeuchi teaches that the nickel and/or cobalt of its composition is present in an amount from 2 to 15 wt%, but, the applicants' claimed composition may have a Group VIII metal present in an amount from 2 to 80 wt%. Also, the Takeuchi composition contains molybdenum and/or tungsten in an amount from 3 to 40 wt%, but, the claimed composition may have a Group VIb metal present in an amount from 5 to 90 wt%. Moreover, the refractory oxide material of the claimed composition may contain more than a small amount of refractory material other than titania. This feature is taught against by the Takeuchi patent.

#### **IV. Claims 28-35**

Claims 28 and 29-35 have been objected to but not rejected by the Examiner. These claims have been amended in response to the objections made by the Examiner. In addition, claim 28 has been placed in independent form that incorporates the limitations of claims 1 and 27 from which it depended. These claims should now be allowable.

#### **V. New claims 37-56**

Claims 37-56 are newly added claims. Among these, claims 37 and 48 are independent claims. Claims 38-47 depend from claim 37, and claims 49-56 depend from claim 48.

The invention of claim 37 is distinguishable over the teachings of the Takeuchi patent in that the patent teaches against the requirement of the presence of both titania and another refractory oxide material in the composition's refractory oxide component where such refractory oxide component contains another refractory oxide material other than titania in a concentration that is more than a small amount. The invention of claim 37 may contain another material up to 50 wt % of the refractory oxide material of the unsupported catalyst composition. Concerning the limitations recited in dependent claims 38-47, the specific combinations of limitations are also not taught by the cited prior art.

The invention of claim 48 is distinguishable over the teachings of the Takeuchi patent in that the patent does not teach an unsupported catalyst composition having a high metals content of from 65 wt% to 95 wt% along with the special titania refractory oxide material. Concerning dependent claims 49-56, the additional combinations of limitations are also not taught by the cited reference.

## **VI. Conclusion**

In view of the above remarks, it is submitted that the claims under examination in this application are patentable. Thus, early allowance of claims 1-6, 27-56 is respectfully requested.

Respectfully submitted,

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